Nov. 10, 1970 C. J. LAMY 3,539,267

WRITING IMPLEMENT

Filed Aug. 13, 1968

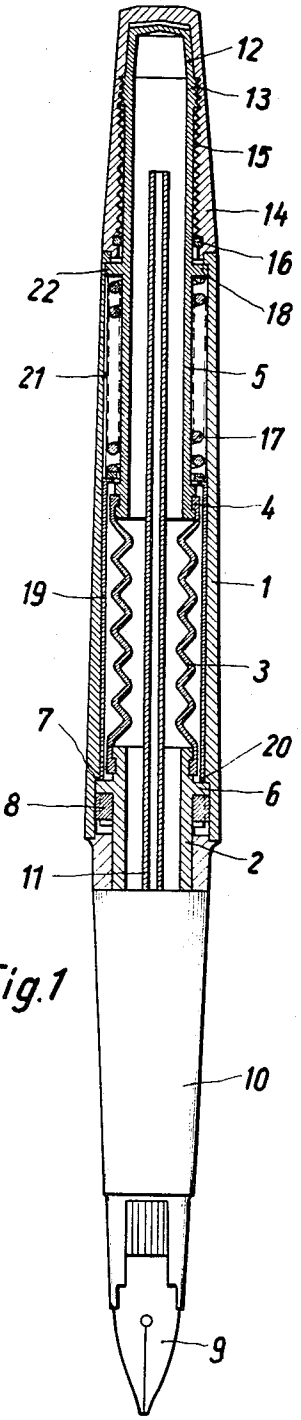

Fig.1

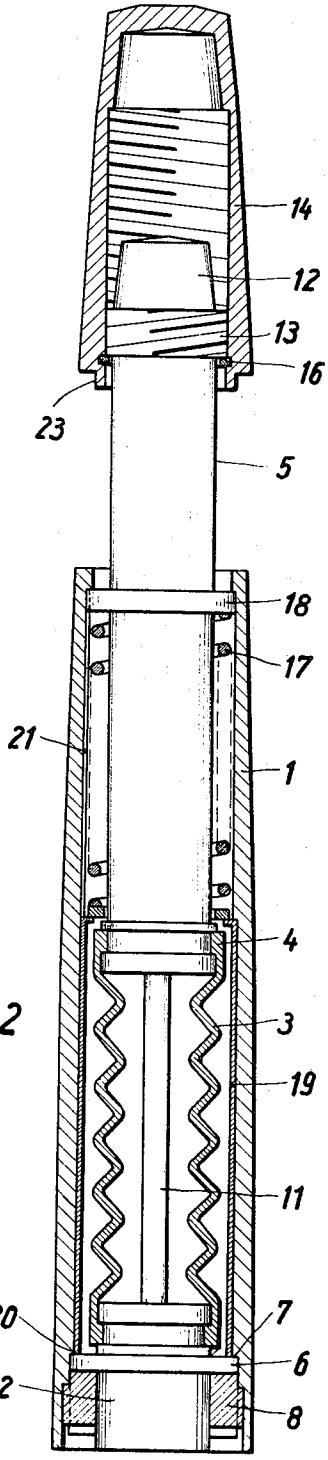

Fig.2

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WRITING IMPLEMENT

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ABSTRACT OF THE DISCLOSURE

A writing implement has a barrel, a flexible liquid reservoir in the barrel, pigment-transfer means provided at the front end of the barrel and communicating with the interior of the reservoir, a piston extending through an open rear end of the barrel partly outwardly therefrom and reciprocably displaceable into the barrel to thereby compress and relax the reservoir and aspirate writing liquid thereinto. An end cap surrounds and is connected to the projecting rear portion of the piston and is longitudinally movable of the latter between two connect positions in one of which it abuts against the rear end of the barrel and conceals the projecting portion of the piston and in the other of which it is located rearwardly of the rear end of the barrel and exposes the piston to an extent substantially corresponding to the distance by which the piston may be moved into the barrel to thereby compress the reservoir therein.

BACKGROUND OF THE INVENTION

The present invention relates to a writing implement in general, and more particularly to a fountain pen. Still more particularly the invention relates to a fountain pen of the type provided with a flexible compressible reservoir in its barrel, and a piston partly extending outwardly through the rear end of the barrel and displaceable into the barrel to compress the reservoir.

In this type of fountain pen the piston is repeatedly displaced deeper into the barrel and thereupon released, whereby the flexible reservoir is compressed and relaxed so that it will aspirate a writing liquid, such as ink, into its interior if the nib provided at the front end of the barrel and communicating with the interior of the reservoir is immersed in such ink. Evidently, care must be taken that the piston will not be accidentally pressed into the barrel when the reservoir contains ink; this would expel ink from the reservoir which could form a blot on a document, or a spot in a garment if for instance the pen is carried in the pocket of a suit or the like. Accordingly, it is known to place an end cap over the projecting portion of the piston and to connect this end cap with the rear end of the barrel, usually by screwing it thereto. Thus, the projecting end portion of the piston is located within the end cap and cannot be depressed unless the end cap is unscrewed and removed.

This type of fountain pen is very popular because the use of a flexible ink reservoir and a reciprocable piston provides them with a large ink capacity and also makes it possible to refill them in a one-hand operation because the fingers of one hand may grip the barrel whereas the thumb of the same hand may reciprocate the piston.

However, fountain pens of this type are possessed of one disadvantage which has long been found annoying, namely the fact that it is necessary to unscrew and separate the end cap from the barrel and from the piston before the latter can be exposed for reciprocation in order to refill the ink reservoir. Aside from the inconvenience involved in doing this, there is the fact that these end caps are rather small and are very easily lost, leaving the possessor of the pen with a writing implement wherein

the rear or actuating portion of the piston is permanently exposed so that even small accidental pressure thereagainst may lead to unintended discharge of ink from the reservoir which in turn may result in damage to clothing or other property.

Accordingly, it is a general object of the present invention to provide a writing implement, particularly a fountain pen of the type here under discussion, which is not subject to these disadvantages.

A more particular object of the invention is to provide such a writing implement wherein the aforementioned end cap cannot be lost.

Still more specifically, it is an object of the invention to provide such a fountain pen wherein the end cap is and remains connected with the piston at all times.

SUMMARY OF THE INVENTION

In accordance with these objects, and others which will become apparent hereafter, one feature of my invention resides in the provision of a writing implement which comprises a barrel having a front end and an open rear end. A flexible liquid reservoir is accommodated in the barrel and adapted to receive pigment-containing liquid. Pigment-transfer means is provided at the front end of the barrel and communicates with the interior of the reservoir. Piston means is partially received in the barrel and has a rear portion which normally projects from the rear end of the barrel, and this piston means is reciprocably displaceable in the barrel to a predetermined extent to thereby compress and relax the flexible reservoir and effect aspiration of liquid thereinto. End cap means surrounds and is connected to the rear portion of the piston means, being movable longitudinally of the latter between two connected positions in one of which it abuts the rear end of the barrel to conceal the piston means and in the other of which it is located sufficiently rearwardly of the rear end of the barrel to expose the piston means by a distance which substantially corresponds to the aforementioned predetermined extent to thereby enable displacing of the piston means for aspirating liquid into the reservoir.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a plan view, partly in longitudinal section, of a writing implement incorporating my invention; and

FIG. 2 is a view, also in longitudinal section but on an enlarged scale, of the rear portion of the writing implement shown in FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Discussing now the drawing in detail, it will be seen that the barrel 1 is open at its front end and at its rear end. It accommodates a hollow piston consisting of the components 2, 3 and 5 which will be discussed hereafter in more detail. The component 2 may be considered the lower portion of the hollow piston, the flexible ink reservoir 3 consisting of rubber or another material and constructed in bellows-shape is secured to the rearward end of the component 2 and may be considered another part of the hollow piston, and the upper end portion 5 may be considered yet a further part of the hollow piston and is secured to the rearward end 4 of the reservoir 3.

However, it will be appreciated that the component 5 in itself may be considered as the piston and that the terminology employed, regardless of whether it encompasses under the term "piston" only the component 5 or all of the components 2, 3 and 5, is relatively unimportant from the point of view of the present invention.

The component 2 is provided with a flange 6 which, when the component 2 is introduced into the front end of the barrel 1, abuts against an inner shoulder 7 provided interiorly of the barrel. An externally threaded ring 8 is thereupon threaded into the open front end of the barrel 1 and abuts against the flange 6 of the component 2, holding the same in place.

The illustrated fountain pen comprises a nib 9 and a holder portion 10 which holds the nib 9 and is suitably secured to the remainder of the pen, either by being screw threadedly connected with the front portion of the barrel 1 or by being screw threadedly connected with the component 2 received in the front portion of the barrel 1. An air-venting tube 11 is carried by the holder portion 10 and extends into the rearward component 5 of the piston.

As the drawing clearly shows, in FIGS. 1 as well as 2, the trailing end portion 12 of the component 5 is provided with annular projecting portion 13 which is exteriorly screw threaded. An end cap 14 is provided with an interior screw thread 15 and is threaded onto the portion 13 so that the screw threads 15 mesh with those of the portion 13.

It will be appreciated that ink is aspirated into the reservoir constituted by the component 3 by depressing the component 5 into the interior of the barrel 1 in a sense compressing the component 3. Releasing of finger pressure upon the component 5 allows the reservoir component 3 to expand, aspirating ink thereinto and simultaneously pushing the component 5 outwardly through the open rear end of the barrel 1 to its starting position. The extent to which the component 5 can be depressed into the interior of the barrel 1 is of course precisely predetermined. In the non-operated position of the component 5, that is when the pen does not require refilling, the end cap 14 is screwed onto the thread of the portion 13 until it abuts with its lower end against the rear end of the barrel 1. In this position, which is illustrated in FIG. 1 as mentioned, the end cap 14 completely conceals the exposed portion of the piston component 5 and protects the same against undesired or accidental reciprocatory displacement.

To permit such displacement when it is desired to compress and relax the reservoir component 3, the end cap 14 is unthreaded to such an extent that its front end is spaced from the rear end of the barrel 1 by a distance corresponding substantially to the extent to which the component 5 can be displaced into the barrel 1 to effect compression of the component 3. However, in order to avoid complete separation of the end cap 14 from the piston component 5, that is to avoid the possible loss which heretofore has been so objectionable in this general type of construction, a suitable abutment is provided at the lower end of the end cap 14, here illustrated as a spring ring 16 which may of course be replaced by an equivalent means. This spring ring 16 abuts against the downwardly or forwardly directed axial face of the projection 13, as illustrated in FIG. 2, when the end cap 14 has been unthreaded to the requisite extent. Thus, unthreading of the end cap 14 to the extent necessary is readily possible, but undesired or accidental separation from the component 5 is prevented. After the reservoir 3 is filled, the end cap 14 is simply screwed down again until it abuts against the rear end of the barrel 1.

If desired it is possible to provide a restoring spring 17 within the barrel 1, although it should be understood that this can be omitted. As pointed out earlier, the inherent elasticity of the component 3 and its tendency to expand when compression pressure upon it is released, will normally restore the component 5 to its starting position. However, for the sake of better understanding I have illustrated in the drawing the possibility of providing a withdrawing spring 17 which abuts with its rear end against a shoulder 18 provided on the component 5 and with its front end against a sleeve 19 inserted into the barrel 1 and having a front edge 20 which rests on the flange 6 of the component 2.

Because the reservoir 3 in this embodiment is rigidly and fluid-tightly connected with the component 5 in such a manner that the interior of the component 5 itself constitutes a part of the liquid reservoir and will also receive ink therein, a turning of component 5 with respect to the reservoir 3 would damage the latter, particularly if it consists of relatively thin material. For this reason it is advantageous if, as illustrated, the barrel 1 is interiorly provided, at least in that portion of the barrel 1 wherein the component 5 is guided for reciprocation, with a longitudinally extending interior groove 21. The component 5 is then provided on its shoulder 18 with a ridge or projection 22 received in the groove 21 so that the component 5 is guided for reciprocation by the cooperation of the projection 22 with the groove 21 but is prevented from performing any angular movements which could lead to a twisting of the reservoir 3, particularly when the end cap 14 is turned in a sense threading it to its advanced position in which it abuts against the rear end of the barrel 1 or to its withdrawn position in which it permits reciprocation of the component 5.

I have illustrated the interior screw threads 15 as extending over the entire height of the hollow end cap 14. This makes it necessary to unscrew the end cap 14 to a corresponding extent before the component 5 is sufficiently exposed for reciprocatory movement. The extent to which the end cap 14 must be unscrewed can be reduced, however, by providing the internal screw thread 15 only in the lower portion of the end cap 14, that is adjacent the open end thereof, and to have the interior bore of the end cap widen upwardly of the internal screw thread 15, rather than converge as shown in FIG. 2. In this case the end cap 14 would simply be slid rearwardly when the component 5 is to be exposed for use, until the external screw thread of the portion 13 of the component 5 would come into mesh with the internal screw thread 15 provided at the inner front end of the end cap 14. To hold the end cap 14 in its closed position abutting against the barrel 1 it would then be necessary to provide it with suitable connecting means, for instance with a projection 23 such as is shown in FIG. 2 and which is externally threaded, while the barrel 1 would have to be internally threaded adjacent its open rear end so that the projection 23 could extend into this open rear end and the threads thereof mesh with those of the barrel 1.

It will be appreciated that the cooperating screw threads on the portion 5 and the end cap 14 may be replaced by other suitable connecting means, for instance a bayonet-type of connection whose construction is well known to those skilled in the art. This would, in fact, reduce the time required for moving the end cap 14 between its two positions still further.

Other modifications possible in the construction according to my invention will be obvious to those skilled in the art, including the fact that it is known to make the component 5 and, if desired, the component 2 of the pen transparent or translucent so as to provide for visual observation of the quantity of ink contained in the reservoir. If the component 2 is made transparent or translucent in this manner, then a corresponding portion of the holder member 10 must similarly be made transparent or translucent to provide for observation of the component 2.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of constructions differing from the types described above.

While the invention has been illustrated and described

as embodied in a writing implement, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the stand point of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be protected by Letters Patent is set forth in the appended claims.

I claim:

1. A writing implement, comprising a barrel having a front end and an open rear end; a liquid reservoir in said barrel and adapted to accommodate pigment-containing liquid; a pigment-transfer device provided at said front end and communicating with the interior of said reservoir for receiving liquid therefrom; aspirating means partially received in said barrel and having a rear portion normally projecting from said rear end, said aspirating means being displaceable into said barrel to a predetermined extent to thereby aspirate liquid into said reservoir; end cap means surrounding and connected to said rear portion of said aspirating means and being movable longitudinally of the latter between two connected positions in one of which it abuts said rear end of said barrel to conceal said aspirating means, and in the other of which it is located sufficiently rearwardly of said rear end to expose said aspirating means by a distance substantially corresponding to said predetermined extent to thereby enable displacing of said aspirating means for aspirating liquid into said reservoir; a spring ring provided on one of said means; and an abutment provided on the other of said means for engaging said spring ring and thereby preventing undesired disconnecting of said means from one another, in response to movement of said end cap means to said other of said positions.

2. A writing implement as defined in claim 1, said aspirating means comprising reciprocable piston means; and further comprising guide means provided on said piston means and in said barrel for guiding said piston means for reciprocatory displacement while preventing rotary movement thereof.

3. A writing implement as defined in claim 1, and further comprising mating screw-threads provided on said rear portion of said aspirating means and in said end cap means, respectively, so that the later may be threadedly displaced on the former between said two positions.

4. A writing implement as defined in claim 1, wherein said abutment is an abutment shoulder.

5. A writing implement as defined in claim 3, said end cap means comprising a hollow end cap having a given depth, and the screw threads in said hollow end cap extending over substantially the entire depth thereof.

6. A writing implement as defined in claim 3, said end cap means comprising a hollow end cap having a given depth, and the screw threads in said hollow end cap extending over a portion of the depth thereof.

7. A writing implement as defined in claim 2, and further comprising restoring means associated with said aspirating means and operative for urging the same out of said open end of said barrel to thereby tend to restore said aspirating means to such position upon displacement of said aspirating means into said barrel.

References Cited

UNITED STATES PATENTS

1,648,241	11/1927	Poetz	401—182
2,056,055	9/1936	Sears	401—169
2,498,384	2/1950	Wikheim	401—182

FOREIGN PATENTS

598,726	2/1948	Great Britain.

LAWRENCE CHARLES, Primary Examiner

U.S. Cl. X.R.

401—153, 169